calculation may be found in the "Gas Engineers Handbook", Ninth Printing, Chapter 8, "Gas Calorimetry", Pages 6-42.

3 C) Amendments to the drawings:

As specified in 37 CFR 1.121(d), all changes to drawings shall be explained in detail, in either the drawing amendment or the remarks section of the amendment paper.

Applicant however elects not to amend the drawings. This non-amendment election will be supported by Applicant deleting the relative Claims which were viewed as the reason to require such correction of the drawings.

4 C) Amendments to the claims:

Applicant will provide a complete set of New Claims in accordance with the requirement for proper status identifier. Said Claims are attached as separate Claims Sheets.

Arguments and supportive reasoning:

Applicant is advised that the amended Claims 23 to 43 in the above stated application are pending but are rejected by the Examiner. Furthermore, the Examiner is objecting to the specification as well as the drawings of the above stated application, even though said application is a Divisional of an issued US Parent Patent.

1) Election/Restriction

The Examiner has acknowledged and accepted the species "Combustion Turbine" together with "Turbine System", as elected by Applicant in his previous response.

2) Information Disclosure Statement

The Examiner indicates that Applicant has incorrectly incorporated an information disclosure reference in the description of the invention. Applicant disagrees with the Examiner and directs the Examiner to the description of the Parent Application 10/293,357, now issued as Patent 6,736,118, wherein similar disclosures were included and accepted by the Commissioner as proper "Background" information to the disclosure.

It was the intent of Applicant to cite such reference in order to provide available general pertinent details to the "Background" of the disclosure. In accordance with MPEP paragraph 608.1 (c), such detailed reference is therefore included in the "Background" portion of the application in support of the feasibility of the method and device disclosed in the "Summary" of the application.

3) Drawings

The Examiner objects to the drawings under 37 CFR 1.83 (a), as not showing every feature of the invention specified in the Claims

Applicant has elected to cancel Claims 27 and 38 which will render the Examiner's objection mute.

4) Specifications

The Examiner objects to the disclosure because of certain formalities.

Applicant will attempt to make the corrections as indicated by the Examiner. In addition, Applicant will make a necessary correction in the Title of the Invention on the cover page of the application.

5) Claim Objections

The Examiner indicates deficiencies in the numbering of the Claims.

Accordingly, Applicant will use the numbering sequence as suggested by the Examiner. Furthermore, the required corrections from "affecting" to "effecting" will also be included.

6) Claim Rejections - 35 USC paragraph 112

The Examiner is further rejecting Claims 23 to 43 as failing to comply with the description, stating that the specification does not provide the necessary disclosures to support the details in some of the Claims. The Examiner is also of the opinion that Applicant, as explained in MPEP 2163.06, was not in possession of the claimed invention such as to be reasonably able to convey the subject matter disclosed in the specification to one skilled in the art.

It appears that the Examiner is not aware of the fact that the application herein under examination is a Divisional Application of a Patent already issued, a Parent Patent which discloses a more or less identical invention and group of Claims, and that a reference to MPEP 2163.06 under such circumstance, and the Examiner stating that

Applicant may not be in possession of the invention, is therefore inappropriate and unfounded.

The Examiner is incorrect, and Applicant herebelow provides the necessary supportive arguments on a Claim by Claim basis.

a) Claims 23 and 34, combustion air operating temperature:

The Examiner claims that no support is provided in the disclosure for an optimal air operating temperature level of between plus 50 and minus 25 degrees Fahrenheit.

Applicant however provides a description of the process of cooling the combustion air in a heat exchange relationship with low temperature fluid hydrocarbon fuel. On page 1 of the disclosure, last paragraph, Applicant describes the known in the art process as one alternative means for cooling turbine inlet air, by using the low temperature of LNG Liquid Natural Gas, which, as anyone skilled in the relevant art would know, may be as low as minus 250 degrees Fahrenheit. Such low fuel temperature easily facilitates a temperature exchange from such fuel to air from an ambient temperature (90 degrees F in summer time) to a level of between 50 degrees and minus 25 degrees Fahrenheit, when used in a temperature transfer relationship with the air.

On page 2, first paragraph of the disclosure, Applicant further describes the employment of special evaporative air coolers to effectively cool combustion air to increase turbine operating efficiency as contemplated in his method and device Claims.

In addition, Applicant is illustrating in Fig. 1 of the drawings, how and where the cool fuel 1 passes through the zone at heat exchanger assembly 7, before being routed through fuel heating exchange assembly 6, in order to first cool combustion air 9 prior to its delivery to the combustion zone 3. The Examiner should refer to page 8 of the description, under "Detailed Description of a Preferred Embodiment", where under Figure 1, the various relative steps of the invention are fully explained and detailed.

Therefore, when referencing Claims 23 and 34 as being unsubstantiated, the Examiner has made a mistake.

Applicant, in accordance with 35 USC paragraph 112, has sufficiently concluded with Claims 23 and 34 and is particularly pointing out and distinctly claiming the subject

matter which Applicant regards as said particular part of the invention, in a manner reasonably conveying its relevance to one skilled in the art.

A person not skilled in the art may have problems recognising the relevancy.

b) Claims 25 and 36, a heat transfer zone related to the exhaust gas vent area of the combustion mechanism:

The Examiner claims that no support is provided in the disclosure for the operation of at least one of said heat transfer zones related to the exhaust gas vent area of the combustion mechanism.

The Examiner is again in error when citing Claims 25 and 36 as not being supported in the description of the invention.

Applicant obviously provides a description of the location of the heating zone at the exhaust area of the combustion mechanism. On page 4 of the disclosure, last paragraph, Applicant describes the zone of heat source related to the combustion mechanism's exhaust area, which, as anyone skilled in the relevant art would know, may exhaust flue gas products at a temperature as high as 1000 degrees Fahrenheit. Such high flue gas temperature easily facilitates a temperature exchange to a fluid such as a fuel from an ambient temperature (90 degrees F in summer time) to a level of between 50 degrees and 900 degrees Fahrenheit, when used in a temperature transfer relationship.

In addition, Applicant is illustrating in Fig. 1 of the drawings, how and where the heat transfer zone in question is located at the combustion mechanism's combustion product exhaust area 10, which, as is well known to someone familiar with the art, is always related to the energy transfer zone 5 of a combustion mechanism. The Examiner should again refer to page 8 of the description, under "Detailed Description of a Preferred Embodiment", where under Figure 1, the various relative steps of the invention and the locations of the heating

zones relative to the exhaust area of the combustion mechanism are fully explained and detailed.

Therefore, when referencing Claims 25 and 36 as being unsubstantiated, the Examiner is again mistaken.

c) Claims 26 and 37, a heat transfer zone related to the exhaust gas vent area of the combustion mechanism:

The Examiner claims that no support is provided in the disclosure for the operation of at least one of said heat transfer zones related to the combustion area of the combustion mechanism.

The Examiner is in error when citing Claims 26 and 37 as not being supported in the description of the invention.

Applicant does provide a description of the location of the heating zone at the combustion area of the combustion mechanism. On page 5 of the disclosure, first paragraph, Applicant describes the zone of heat source related to the combustion mechanism's combustion area or a heating zone located in the interior of the mechanism, identified in Figure 2 as location 3, which, as anyone skilled in the relevant art would know, may produce combustion products at a temperature as high as or higher than 1300 degrees Fahrenheit. Such high combustion product temperature easily facilitates a temperature exchange to a fluid, such as a fluid hydrocarbon fuel, from an ambient temperature (90 degrees F in summer time) to a level of between 50 degrees and 900 degrees Fahrenheit, when used in an efficient heat transfer relationship.

Applicant is illustrating in Fig. 2 of the drawings, that the heat transfer zone in question is located near the combustion mechanism's interior combustion area 3 and is identified as area 6, which, as is well known to someone familiar with the art, is the first energy transfer zone of a combustion mechanism, experiencing its highest temperatures.

The Examiner should again refer to page 8 of the description, under "Detailed Description of a Preferred Embodiment", where under Figure 2, the various relative steps of the invention and the location of the heating zone relative to the combustion area of the combustion mechanism is fully explained and detailed.

The Examiner should also realise that both the high temperature combustion products or combustion vent products of a combustion mechanism may also be employed as efficient means to operate an air cooling or refrigeration system by way of thermochemical compression.

The Examiner may want to refer to:
A Brief Primer on Natural Gas Air Conditioning Technologies

There are three basic types of natural gas air conditioning systems:

1. absorption cycle,
2. engine-driven,
3. desiccant systems.

In Southern California, the **absorption cycle** is the most popular natural gas air conditioning system and is similar to electrical systems in that it utilizes a cycle of evaporation and condensation of a fluid or refrigerant to produce cooling.

However, such absorption cycle cooling differs from the vapour compression cycle by **using heat as a "thermochemical compressor" rather than a mechanically-driven compressor.** The source of energy for compression can be from the heat (or waste-heat) from a combustion turbine system fired with gas, oil or coal products, or from a steam or hot water operated dual cycle systems.

Therefore, when referencing Claims 26 and 37 as being unsubstantiated, the Examiner is again mistaken.

Applicant however agrees that a person not skilled in the art may have problems recognising the relevancy of that segment of the disclosure.

d) Claims 27 and 38, a heat transfer zone related to a zone other than the exhaust gas vent area of the combustion mechanism:

The Examiner claims that no support is provided in the disclosure for the operation of an alternative heat transfer zone other than the combustion or exhaust gas vent areas of the combustion mechanism.

The Examiner is again continuing to make the same grave error as previously when citing Claims 27 and 38 as not being supported in the description of the invention.

Applicant unmistakably provides an ample description of one obvious location of such an alternative heat transfer zone at said combustion mechanism when describing and illustrating the heat transfer zone located at the air intake location. Furthermore, on page 5 of the disclosure, first paragraph, Applicant purposely indicates that, when access of a heating zone related to the combustion mechanism is not readily available, a heating zone may be employed using heat or energy transfer means from any other operating source known in the art, which may be unrelated to the combustion mechanism.

Therefore, as an alternative, any heat source known in the art may provide the necessary means to operate a heating zone. It is not intended to describe all heating zone means available in the art, but what is being claimed is an example of the most economical means of operating a heating means in an operating zone available under the circumstance. The MOST efficient means of course being a heating zone operated with waste heat from the combustor. This is not meant to exclude any of the other known in the art alternatives.

In fact, Applicant specifies in his description that
"It must be noted that only a few embodiments of the invention have been illustrated and described and that this disclosure is not intended to be limited thereby but only by the scope and intent of the appended Claims."

In addition, Applicant is illustrating in Fig. 1, 2, 3 and 4 of the drawings, a heat transfer zone 7 not located near the combustion mechanism's exhaust vent area 10, or interior combustion area 3, or the combustion mechanism's energy transfer area 5, which are all areas well known to someone familiar with the art. The Examiner should again refer to page 8 of the description, under "Detailed Description of a Preferred Embodiment", where under Figure 1, 2, 3 and 4, the various relative steps of the invention and the location of a heating zone other than relative to the combustion area or exhaust vent area of the combustion mechanism are fully explained and detailed.

Therefore, when referencing Claims 27 and 38 as being unsubstantiated, the Examiner is again mistaken.

e) Claim 29, a single or dual cycle turbine system:
The Examiner claims that no support is provided in the disclosure for the application of the claimed method and device to operate a combustion mechanism for a single or dual cycle turbine system.

The Examiner may be again in error as previously when citing Claim 29 as not being supported in the description of the invention.

In order to substantiate the objection that the combustion method and device claimed by Applicant is not supported in the description, the Examiner would have to prove to someone skilled in the art that the disclosed combustion mechanism is unable to function with the operation of a turbine in said single or dual cycle configuration.

It is of course obvious to someone skilled in the art that the combustion method and device claimed will operate with a combustion mechanism attached to all types of turbine configurations, because the combustion mechanism is a self contained mechanism but is required to be attached as a related and driving part to all turbine configuration, single cycle, dual cycle, triple cycle or otherwise.

Therefore, when referencing Claims 29 as being unsubstantiated, the Examiner is incorrect.

f) Claim 32, a fuel being a suspended coal dust or coal dust slurry:

The Examiner claims that no support is provided in the disclosure for the application of the claimed method and device to operate with fuel consisting of a suspended coal dust or a coal dust slurry.

The Examiner continues to make a further error when citing Claim 32 as not being supported in the description of the invention.

Applicant is very clear in his description of the fuel accommodated in the invention, it being a fluid hydrocarbon fuel. In order for the Examiner to substantiate the objection as posed, the Examiner would have to demonstrate and prove to someone skilled in the art that a fuel consisting of a mixture of coal dust and air, or coal dust and a vaporised gas, is not a fluid hydrocarbon fuel. The Examiner would need to further demonstrate and prove to someone skilled in the art that a fuel consisting of a mixture of coal dust and fuel oil to form a slurry is not a fluid hydrocarbon fuel.

Both a suspended coal dust mixture and a coal dust slurry mixture as contemplated by Applicant are considered a fluid hydrocarbon by any person skilled in the art, and such fuel mixture may be found in any listing of fluid hydrocarbon fuels. Applicant has included such variation in Claim 32 so as to further limit the general fluid hydrocarbon fuel

description in both Claim 23 and Claim 34, all in accordance with the prescribed requirement for Claim structure.

Applicant suggests that the Examiner reviews MPEP 608.01 (m), FORM OF CLAIMS, which clearly states that Claims should be arranged in order of scope, so that the first Claim presented is the broadest (fluid hydrocarbon fuel), and wherein any dependent Claim thereon should further limit such earlier Claim (coal dust slurry).

The Examiner should also review the reference listed under ***8)***, on page 21 and 22, providing detailed and pertinent definitions of "FLUIDS" in accordance with the art.

Applicant further suggests for the Examiner to refer to USC 35 paragraph 112, SPECIFICATIONS, which states that a Claim in dependent form (Claim 32) shall contain a reference to a Claim previously set forth (Claim 23 or Claim 34, -fluid hydrocarbon fuel-), and then specify a further limitation (suspended coal dust or coal dust slurry) of the subject matter claimed in the dependent Claim (32).

Applicant is in full compliance with such prescribed practice, and when the Examiner is referencing Claim 32 as being unsubstantiated, the Examiner has again continued to make a further very obvious mistake.

h) Claim 41, converting the oxidation mixture:

The Examiner claims that no support is provided in the disclosure for the process of converting the oxidation mixture of fuel and air into a high temperature, high velocity combustion product.

The Examiner is committing a further error when citing Claim 41 as not being supported in the description of the invention.

As is apparent to one skilled in the art, the average turbine requires approximately 445 lb (24 cft) per hour of fuel to produce one MWH MegaWattHour of energy.

As the average size of a generating turbine is 150 MWH, the average fuel consumption would be 3,600 cft of fuel per hour. Because the ratio of combustion air to fuel gas is at an average 10:1, the total amount of oxidant mix volume (combination of air and fuel gas) flowing into and through the combustion area, both before and after ignition, would be 39,600 cft per hour. It is obvious that such large amount of fuel would move at a very rapid pace into and through the combustion area of a combustion mechanism. The speed of the oxidant mix flow will be significantly increased as a result of its ignition and combustion in the combustion mechanism, and the typical energy transfer and flow speed of the resulting combustion products may then be subjected to a number of energy exchange methods. The process in this case converts the energy produced during the combustion of the oxidation mix into a pressurized high velocity rotational force for the operation of a generating turbine, or any turbine engine configuration for that matter, stationary or mobile.

Therefore, when Applicant, in dependent Claim 41, claims the conversion of the oxidation mixture into high temperature, high velocity combustion product, Applicant only refers more specifically to the combustion process of a combustion mechanism used to convert the energy produced into thrust or torque, as described in independent Claims 23 and 34, thereby limiting it to the rotational force required to operate a turbine.

Applicant properly formulates Claim 41 in accordance with the prescribed practice, wherein said dependent Claim 41 is a further limitation to independent Claims 23 or 34.

Applicant suggests that the Examiner again reviews MPEP 608.01 (m), FORM OF CLAIMS, which clearly states that Claims should be arranged in order of scope, so that the first Claim (Claim 23 or 34, or independent Claim), presented is the broadest (energy conversion to heat, thrust or torque), and wherein any dependent Claim (Claim41) thereon should further limit (thrust or torque) such earlier Claim.

Furthermore, as it is specifically applicable to this objection, Applicant suggests that the Examiner again reviews MPEP 608.01, ORIGINAL CLAIMS, in which is stated that in establishing a disclosure, Applicant may rely not only on the description and on the drawings as filed, but also on the original Claims, if their content justifies it.

As one familiar in the art understands, the reference to forming an oxidation mixture merely describes more precisely the combustion process in a turbine system.

The Examiner has failed to demonstrate that the content of Claim 41 lacks the required descriptive nature and instead the Claim content is therefore fully justified. The Examiner has again erred.

i) Claims 27 and 38, second reference to a heat transfer zone related to a zone other than the exhaust gas vent area of the combustion mechanism:

The Examiner claims that no support is provided in the disclosure for the operation of an alternative heat transfer zone other than the combustion or exhaust gas vent areas of the combustion mechanism.

In this case the Examiner is unclear when citing Claims 27 and 38 again in double succession as not being supported in the description of the invention.

The Examiner makes use of a double negative when citing the objection, and Applicant is unable to respond to the Examiner's contradictory statement.

However, Applicant has already previously provided ample description of one obvious location of both an alternative heat transfer zone at said combustion mechanism, when describing the heat transfer zone located at the air intake location, as well as the location of a heat transfer zone related to the combustion mechanism. Applicant suggests for the Examiner to again refer to the description with more care, where on page 5 of the disclosure, first paragraph, Applicant purposely indicates that when access of a heating zone

related to the combustion mechanism is not readily available, a heating zone may be employed using heat or energy transfer means from any other operating source known in the art, unrelated to the combustion mechanism, thereby making reference to both a heating zone at the combustion mechanism and the alternative thereto.

j) Claims 23 and 43, are rejected under 35 U.S.C. 112:

The Examiner cites the second paragraph of such Patent Law which reads:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The Examiner therefore is rejecting Claims 23 to 43 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as his invention.

If the Examiner is unable to understand the relative Claims and related description of the invention under examination, Applicant respectfully suggests to confer with Primary Examiner Marguerite McMahon, of art unit 3747, and with Department Supervisor Mr. J. Lazarus, which have processed the original Parent Patent of the application being examined herein, and have caused issuance of said Parent Patent on May 18, 2004 without any of the objections being cited herein by the Examiner.

It is Applicant's opinion that there exists a serious conflict of Examination Procedure, and if the Examiner is sure the referred to Parent Application was issued in error, the Examiner should make Ms. McMahon aware of all the defects contained in said Parent Patent, defects which are now the cause of objections by this Examiner.

Applicant however would be more inclined to believe that the Parent Patent was issued competently, and, because the present application is based on instructions issued under such Parent Patent, the objections raised by the Examiner appear unfounded.

In fact, when reviewing independent Claim 23 alone, which reads, or may read, after some of the by the Examiner suggested corrections are followed:

23. **A method** for reducing fuel density while increasing combustion air density, without effecting their specified volume, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels, in combustion mechanisms having a combustion area and at least one burner therein for converting said fuel into heat, thrust, torque or other energy, comprising:

a) providing fluid hydrocarbon fuel as fuel for said combustion mechanism;
b) directing said fuel through the fuel supply conduit defining a first heat exchanger assembly that extends through a first heat transfer zone related to the combustion mechanism;
c) reducing the density of said fuel by heating the fuel as it flows through said first heat exchanger assembly to an optimal fuel operating temperature level ranging between 165 degrees Fahrenheit and the fuel's flash point or auto ignition level;
d) maintaining a constant volume of density reduced fuel to the combustion area of said combustion mechanism;
e) providing combustion air for the combustion process in said combustion mechanism;
f) directing said combustion air through an air supply conduit defining a second heat exchanger assembly that extends through a second heat transfer zone;
g) increasing the density of said combustion air by cooling the combustion air as it flows through said second heat exchanger assembly to an optimal air operating temperature level of between ambient and minus ~~40~~ degrees Fahrenheit;
h) maintaining a constant volume of density increased combustion air to the combustion area of said combustion mechanism;

and as such fully describes, particularly points out and distinctly claims the subject matter which the Applicant regards as his invention, and which is already competently approved and recognised as such by the US Patent Office, documented in the issuance of the Parent Patent 6,736,118

If the Examiner is in conflict with such parameter, the Examiner should suggest to the Commissioner of Patents that the Commissioner review this particular case, as his seal and signature are affixed to the said approved and issued Parent Patent. Otherwise, Applicant respectfully suggests for the Examiner to admit that a further error occurred.

As already indicated, Applicant may make the necessary change and eliminating the phrases "such as" and "or the like", although such reference more precisely defines the invention and is precedent in previously approved and issued patents.

7) Double Patenting:

The Examiner cites the following:

Rejection based on double patenting of the "same invention" is supported in 35 USC 101.

The Examiner is again contradicting an office decision arrived at when processing the Parent Application. At that time the US Patent Office came to the conclusion that the Divisional Application herein examined is NOT "the same invention", it requested to divide all other Inventions from what has subsequently become the Parent Application.

Applicant herewith cites the US Patent Office decision as formulated in the first office action of Examiner McMahon, dated July 17, 2003.

DETAILED ACTION

Election / Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121;

Invention I	Various types of heaters	class 431
Invention II	A single or dual cycle power generator	class 310
Invention III	A gas turbine engine	class 60
Invention IV	An internal combustion engine	class 123

The inventions are distinct, each from each other because of the following reasons:
Inventions I, II, III and IV are unrelated as it can be shown that they perform different functions, all in accordance with the quoted reference MPEP paragraph 806.04 and paragraph 808.01.

When filing the original Parent Application, it was Applicant's intention to show that the invention was one invention and that no restriction was required, but it was the decision of the Patent Office that said application contained at least four separate Inventions.

If the Examiner in this action continues to be of a different opinion, Applicant respectfully suggests for the Examiner to take the necessary steps within the US Patent Office to demonstrate that the Commissioner has acted in error when requesting division and when issuing the Parent Application, and that the Examiner has all the necessary information to prove such error.

For Examiner's guidance, Applicant would further like to draw attention to the following rules and regulations with regards to a rejection under Double Patenting.

35 U.S.C. 121 DIVISIONAL APPLICATION provides the following rule.
If two or more independent and distinct inventions are claimed in one application, the Director may require the application to be restricted to one of the inventions. If the other invention is made the subject of a divisional application which complies with the requirements of section 120 of this title, it shall be entitled to the benefit of the filing date of the original application. A patent issuing on an application with respect to which a requirement for restriction under this section has been made, or on an application filed as a

result of such requirement, shall not be used as reference either in the Patent and Trademark Office or in the courts against a divisional application or against the original application or any patent issued on either of them, if the divisional application is filed before the issuance of the patent on the other application.

With regards to any possible conflict between applications 10/798,294 and 10/798,292, it is Applicant's intention, depending on the decision by the Examiner which of the present Claims may be finally accepted, to accept restriction of application 294 to turbine applications as classified in class 60 (Invention III as per original Restriction), while application 292 is restricted to industrial process heaters and furnaces or smelters for commercial and heavy industrial operation, as may be classified in class 431 (Invention I as per original Restriction).

Should application 292 create a conflict for other reasons, Applicant may amend the Claims to refer instead to cycling generators (Invention II, class 310).

Where required, Applicant will nevertheless endeavor to amend Claims in such a fashion as to overcome any possible objections that may be plausible, as already indicated. If necessary, Applicant will attach Amendments, including amended Claims pages for replacement of the original.

With regard to the filing date of application 10/798,294, Applicant respectfully draws attention to the 35 U.S.C. 120 rule, which states that a divisional application shall be entitled to the filing date of the parent application, such filing date being November 14, 2002.

8) Claims Rejection under 35 USC paragraph 102:

The Examiner cites that Claims 23, 25, 28, 30, 31, 33, 34, 36, 39, 41 and 43 are rejected as being anticipated by Arenson in his Patent 3,720,057.

The Examiner continues to make incorrect and incomplete assumptions when citing such rejection.

It is obvious that the Examiner has ignored one of the major distinction of Applicant's invention, disclosed and described in both independent Claims. Applicant makes specific reference to the hydrocarbon fuel being a fluid. I suggest for the Examiner to investigate the specific meaning and allocation of the word fluid, especially when the word is to describe a matter other than a liquid, like air, or a gas already in its vaporous state.

This is in fact the reason why Applicant has referred to the fluid hydrocarbon fuel described in his independent Claims as a fluid fuel "such as" natural gas, and "or the like" in order to provide the distinction of such fuel being in a state other than a liquid, such as a vapour or a gas, all as in previously issued patents.

When the Examiner objects to the use of the phrase "such as" and "the like", on the basis that it renders the Claims indefinite, the Examiner is in error. In fact the use of the objected to phrases in this case render the Claims more specific and more clear. Therefore the Examiner may reconsider such objection.

The difference and uniqueness of Applicant's invention over Arensen is related directly to such contained and significantly distinct subject matter detailed in the description and Claims, the fundamental difference between "Fluid" and "Liquid".

For the Examiner's understanding, the following is the Webster's Dictionary definition of "FLUID":

Definition: Fluid

Adjective

1. Subject to change; variable; "a fluid situation fraught with uncertainty"; "everything was unstable following the coup.

2. Characteristic of a fluid; capable of flowing and easily changing shape.
3. Smooth and unconstrained in movement; "a long, smooth stride"; "the fluid motion of a cat"; "the liquid grace of a ballerina"; "liquid prose".
4. In cash or easily convertible to cash; "liquid (or fluid) assets".
5. Affording change (especially in social status); "Britain is not a truly fluid society"; "upwardly mobile".

Noun
1. A substance that is fluid at room temperature and pressure.

2. A continuous amorphous substance that tends to flow and to conform to the outline of its container: **a liquid or a gas**.

Specialty Definition: Fluid

Aerospace
A substance which, when in static equilibrium, cannot sustain a shear stress;
a liquid or a gas. This concept is only approximated by actual liquids and gases.

Mining
A. The quality, state, or degree of being **fluid**: **a liquid or gaseous state**. CF:gas
B. The physical property of a substance that enables it to flow and that is a measure of the rate at which it is deformed by a shearing stress, as contrasted with viscosity: the reciprocal of viscosity.
C. In mineral transport, the term is **not confined to liquids and slurries, but is also used for finely divided solids that flow readily in aircurrents**, fluosolids reactors, or through dry ball mills.

Fluid Mechanics
A branch of science that deals with the special properties of **liquids, vapours and gases**.

Based on the before listed definition of a "Fluid Hydrocarbon Fuel", the Examiner should be able to recognise that the Arenson disclosure is not at all related to the present invention. In fact, when reviewing the Arenson Claim 1, the difference is most obvious.

Arenson defines his invention as
"A method of continuously vaporising and superheating a stream of liquefied cryogenic fluid for an ultimate use, comprising the steps of a) passing said cryogenic fluid in heat exchange relationship with ambient water to heat and vaporise said cryogenic fluid stream".

As the Examiner has surely noticed, said segment of the method claimed by Arenson is strictly for the purpose of converting stored LNG Liquid Natural Gas, or LPG Liquid Propane Gas or other liquid cryogenic fluids, into their vaporous state. The described liquid cryogenic fluid is understood to be at a temperature of minus 260 degrees Fahrenheit.
See column 10, Example 1 of US 3,720,057.

Applicant defines a specific Combination Method in his invention in independent Claim 23 as *"A method for reducing fuel density while increasing combustion air density for the purpose of significantly changing the ration of oxygen mass".*

The method combination claimed by Applicant for the equivalent fuel preheating segment of the combination is NOT for the purpose of vaporising the fuel, but is instead specifically for improving the ratio of oxygen mass versus fuel mass. Applicant further describes the lowest ambient operating level of a gaseous fuel, or liquid fuel for that matter, from which temperature will be raised, as 35 degrees Fahrenheit.
See page 3, 2nd paragraph of the application.

There is absolutely NO comparison to be drawn between the method disclosed by Arenson and the combination method described in Applicant's disclosure. Even in view of the Velke US 5,888,060 Patent, persons familiar in the art would be unable to reach the conclusion speculated by the Examiner. In fact, Applicant herebelow provides the necessary

support for his conclusion by citing a response received by the CGRI Canadian Gas Research Institute, a Canadian gas combustion expert, which had been requested, under a suitable confidentiality arrangement, to prove an opinion as to the preheating of fuel resulting in an improvement or increase in the oxygen ratio in a combustion process.

Following was the CGRI response:

In a letter addressed to the Applicant, dated April 27, 1999, CGRI Research Engineer Martin Thomas provided an opinion on behalf of the Canadian Gas Research Institute, that:

"Oxygen enrichment of the combustion air (i.e. increasing the oxygen concentration in a volume of combustion air) is a well established industrial process improvement technique. In our opinion, the "Velke Invention of preheating a fuel gas" *does not provide oxygen enrichment. To our knowledge, oxygen enrichment can only be achieved by adding oxygen to air, or by removing the other constituents (nitrogen, CO2, argon, etc.) from the air. Therefore, we cannot support the claims made for the* "Velke Disclosure" *as a result of improvements caused by oxygen enrichment."*

CGRI the Canadian Gas Research Institute, a well recognised authority in the gas industry, thereby confirms industry opinion that the any enrichment or increase in the oxygen ratio of a given volume of combustion air can only be achieved by adding actual oxygen, or by removing the other constituents, but cannot be achieved by any other means, such as preheating of fuel or precooling of combustion air.

CGRI concludes its letter of opinion by stating that *"Because CGRI is unable to explain, through sound scientific principles, the claimed / measured benefits,....CGRI will no longer be involved in the evaluation process."*

Applicant's invention is therewith definitely confirmed as being unique. Such method is never disclosed, nor contemplated or expected in the Arenson or any other invention.

Any further relations cited by the Examiner between Arenson and Velke, including some of the operating stages of the 5,888,060 disclosure, do NOT provide the required obviousness to anyone skilled in the art, as claimed by the Examiner.

In the present invention, Applicant distinctly claims an increase of the oxygen ratio in the maintained as specified combustion oxidation mixture volume.

Velke, in US Patent 5,888,060 instead claims a method resulting in a reduction of fuel consumption by way of reducing fuel density, or increasing fuel volume, which is all and the same, but the invention does not contemplate nor claim the increase in the oxygen ratio in the fuel / combustion air mix (the oxidation mixture), nor does the invention make any reference to the method of using the combination of heating of fuel and the cooling of combustion air in order to improve the oxygen ratio, even though, as the examiner states, some of the intermediate operating stages may be similar. Any such similarity of operating stages does NOT conclude the methods to be identical. In fact, the disclosed methods are in stark contrast.

Although the prior art cited is not relied upon, Applicant nevertheless provided the above response to demonstrate and prove the Examiner's further obvious error.

9) Allowable Subject Matter under 35 USC paragraph 112:

The Examiner cites that Claims 29, 32 and 42 would be allowable if rewritten to overcome the rejections under 35 USC 112, and to include all of the limitations of the base Claim and any intervening Claims.

It is Applicant's opinion to have satisfactorily demonstrated the following:

Claim 29 In accordance with the reasoning provided under **e)**, Applicant is of the opinion that the Examiner has NOT proven to someone skilled in the art that the combustion mechanism as disclosed in the invention is unable to function with the operation of all

turbine configurations, single, dual or triple cycle. A gas turbine is a gas turbine is a gas turbine.

Claim 32 In accordance with the reasoning provided under **f)**, Applicant is again sure that the Examiner has failed to prove to someone skilled in the art that a fuel consisting of a mixture of coal dust and air, coal dust and natural gas, or coal dust and fuel oil forming a coal dust slurry, is not a fluid hydrocarbon fuel.

Claim 42 In accordance with the reasoning provided, Applicant is again sure that the Examiner has failed to prove to someone skilled in the art a fluid hydrocarbon fuel does NOT include or signify a fluid fuel other than a gaseous fuel like natural gas or propane gas, and that such fluid fuel may be a liquid like a fuel oil or a liquid consisting of a slurry mixture of coal dust and fuel oil.

Unless the Examiner can provide the scientific proof that Applicant is incorrect in his arguments against said Claims being improper, Applicant would prefer not to rewrite any of the by the Examiner cited corrections.

Applicant is convinced that the Examiner has made further incorrect and incomplete assumptions when citing such objection.

10) Conclusion

The Examiner in the Conclusion states that the prior art made of record and relied upon by the Examiner is pertinent, whereby Arenson discloses the heating of LNG Liquid Natural Gas fuel for the purpose of vaporising such liquid fuel, and whereby Arenson further discloses the cooling of inlet air for the purpose of reducing the operating temperature of the turbine blades and general turbine structure, which is normally heat effected, especially when additional heated fuel is introduced. Nowhere does Arenson disclose the preheating of a non liquid fuel, as does Applicant, nor does Arenson disclose his fuel preheating in

combination with the precooling of combustion air for the purpose of increasing the ratio of oxygen during ignition and combustion of said oxidation mixture, which combination method is neither disclosed in US 5,888,060.

Applicant will attach certain Claim amendments for Examiner's consideration, but Applicant will base such amendments on the arguments provided in this response.

Applicant therefore respectfully request, based on all the valid arguments provided in this response, that the Examiner move this application now to allowance

.

As a final conclusion, Applicant is of the opinion that a divisional application must benefit not only from the original filing date of the Parent Application, but must also, should such Parent Application be issued as a Parent Patent while the divisional application is still under examination, benefit from the established Claims and disclosure, except for the particular Claim, or Claims, which may be the cause of the divisional process and thereby formulate the new, distinct and different invention.

If the Examiner finds that Applicant has been too vague or lacking suitable substantiating arguments in his response to this office action, Applicant will be open to Examiner's further guidance, and Applicant will then endeavour to provide a further corrected and more detailed response when so requested.

Signed this 6th day of May, 2005,

William H. Velke
Applicant

Attachment: New Claims

Claims 23 to 43 (Cancelled)

I claim:

44. (New) **A method** for reducing fuel density while increasing combustion air density, without effecting their specified volume, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels in combustion mechanisms having a combustion area and at least one burner therein for converting said fuel into heat, thrust, torque or other energy, comprising:

a) providing fluid hydrocarbon fuel as fuel for said combustion mechanism;

b) directing said fuel through the fuel supply conduit defining a first heat exchanger assembly that extends through a first heat transfer zone related to the combustion mechanism;

d) reducing the density of said fuel by heating the fuel as it flows through said first heat exchanger assembly to an optimal fuel operating temperature level ranging between 165 degrees Fahrenheit and the fuel's flash point or auto ignition level;

i) maintaining a constant volume of density reduced fuel to the combustion area of said combustion mechanism;

j) providing combustion air for the combustion process in said combustion mechanism;

k) directing said combustion air through an air supply conduit defining a second heat exchanger assembly that extends through a second heat transfer zone;

l) increasing the density of said combustion air by cooling the combustion air as it flows through said second heat exchanger assembly to an optimal air operating temperature level of between ambient and minus 40 degrees Fahrenheit;

m) maintaining a constant volume of density increased combustion air to the combustion area of said combustion mechanism.

45. (New) A method according to Claim 44, wherein at least one of said heat transfer zones is related to the exhaust gas vent area of the combustion mechanism.

46. (New) A method according to Claim 44, wherein at least one of said heat transfer zones is related to the combustion area of the combustion mechanism.

47. (New) A method according to Claim 44, wherein at least one of the heat transfer zones is operated from a source other than the combustion or exhaust gas vent area of the combustion mechanism.

48. (New) A method according to Claim 44, wherein said preselected optimal fuel operating temperature range is within the preselected general fuel operating temperature range from 165 degrees to 900 degrees Fahrenheit.

49. (New) A method according to Claim 44, wherein the combustion mechanism converts the oxidation mixture of fuel and air into high temperature, high velocity combustion products to operate a single or dual cycle turbine system.

50. (New) A method according to Claim 44, wherein the combustion mechanism is part of a combustion turbine.

51. (New) A method according to Claim 44, wherein at least one of the two heat exchanger assemblies is operational.

52. (New) A method according to Claim 44, wherein the fluid hydrocarbon fuel is suspended coal dust, or a coal dust slurry.

53. (New) A method according to Claim 44, wherein the fluid hydrocarbon fuel is a liquid fuel.

54. (New) A **device** for reducing fuel density while increasing combustion air density, without effecting their specified volumes, thereby significantly changing the ratio of fuel mass versus combustion air mass, hence oxygen mass, during the process of ignition and combustion of fluid hydrocarbon fuels in combustion mechanisms having a combustion area and at least one burner therein for converting said fuel into heat, thrust, ~~or~~ torque or other energy comprising:

a) a fuel supply conduit defining a first heat exchanger assembly located in a heating zone related to the combustion area of the mechanism, providing the means to maintain a constant supply of fluid hydrocarbon fuel to the combustion area of said mechanism at a preselected optimal operating temperature level ranging between 165 degrees Fahrenheit and the fuel's flash point or auto ignition level;

b) a combustion air supply conduit defining a second heat exchanger assembly located in a cooling zone related to the combustion mechanism, providing the means to maintain a constant volume of combustion air to the combustion area of said mechanism at a preselected optimal operating temperature level ranging between ambient and minus 40 degrees Fahrenheit.

55. (New) A device according to Claim 54, wherein at least one heat transfer zone is related to the exhaust gas vent area of the combustion mechanism.

56. (New) A device according to Claim 54, wherein at least one heat transfer zone is related to the combustion area of the combustion mechanism.

57. (New) A device according to Claim 54, wherein the heat transfer zones are related to an operating source other than the combustion or exhaust gas vent area of the combustion mechanism.

58. (New) A device according to Claim 54, wherein said means to maintain a continuous volume of fluid hydrocarbon fuel to the burners in the combustion area of the mechanism at said optimal fuel temperature level operates within a preselected operating temperature range between 165 degrees and 900 degrees Fahrenheit.

59. (New) A device according to Claim 54, wherein a preselected volume of combustion air is routed through a contained duct system which provides temperature control and the means for density increase of said combustion air volume by cooling the air to a preselected temperature range below ambient prior to combustion.

60. (New) A device according to Claim 54, which provides the means for the combustion mechanism to convert an oxidation mixture of fuel and air into high temperature, high velocity combustion products for the purpose of operating a related turbine system.

61. (New) A device according to Claim 54, wherein the fluid hydrocarbon fuel is a fluid fuel other than natural gas or propane gas.

62. (New) A device according to Claim 54, wherein the fluid hydrocarbon fuel is supended coal dust, or a coal dust slurry.

63. (New) A device according to Claim 54, wherein at least one of the two heat exchanger assemblies is operational.